

IN THE CLAIMS

Please amend the claims as follows:

1. (Original) An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

at least one of the following on one or more substrates: metallization forming a power amplifier impedance transformer, metallization forming a low noise amplifier input matching circuit, and metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna; and

at least one electrical terminal to couple said antenna interface circuit to a microelectronic device package.

2. (Original) The antenna interface circuit of claim 1, wherein:

said at least one electrical terminal is for direct connection to one or more corresponding terminals on a side of the microelectronic device package that has a microelectronic die mounted thereto.

3. (Currently Amended) ~~The antenna interface circuit of claim 1, further comprising:~~ An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

at least one of the following on one or more substrates: metallization forming a power amplifier impedance transformer, metallization forming a low noise amplifier input matching circuit, and metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna;

at least one electrical terminal to couple said antenna interface circuit to a microelectronic device package; and

at least one electrical terminal to couple said antenna interface circuit to an external antenna.

4. (Original) The antenna interface circuit of claim 1, further comprising:

metallization forming an integrated antenna.

5. (Original) The antenna interface circuit of claim 1, wherein:
said antenna interface circuit includes multiple metallization layers.

6. (Currently Amended) ~~The antenna interface circuit of claim 5, comprising:~~ An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

at least one of the following on one or more substrates: metallization forming a power amplifier impedance transformer, metallization forming a low noise amplifier input matching circuit, and metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna; and

at least one electrical terminal to couple said antenna interface circuit to a microelectronic device package;

wherein metallization forming a power amplifier impedance transformer is located on one metallization layer and metallization forming a low noise amplifier input matching circuit is located on another, different metallization layer.

7. (Original) The antenna interface circuit of claim 5, wherein:
at least one of said multiple metallization layers includes a ground plane.

8. (Currently Amended) ~~The antenna interface circuit of claim 1, wherein:~~ An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

at least one of the following on one or more substrates: metallization forming a power amplifier impedance transformer, metallization forming a low noise amplifier input matching circuit, and metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna; and

at least one electrical terminal to couple said antenna interface circuit to a microelectronic device package;

wherein said antenna interface circuit is flexible.

9. (Original) The antenna interface circuit of claim 1, wherein:

said at least one electrical terminal includes a ball grid array (BGA).

10. (Currently Amended) ~~The antenna interface circuit of claim 1, further comprising:~~ An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

at least one of the following on one or more substrates: metallization forming a power amplifier impedance transformer, metallization forming a low noise amplifier input matching circuit, and metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna;

at least one electrical terminal to couple said antenna interface circuit to a microelectronic device package; and

metallization forming at least one radio frequency choke to couple a transistor within the packaged microelectronic device to a power supply.

11. (Original) An antenna interface circuit to provide an interface between a packaged microelectronic device and an antenna, comprising:

first metallization forming a power amplifier impedance transformer, second metallization forming a low noise amplifier input matching circuit, and third metallization forming a duplexer to couple an external transmitter and an external receiver to a common antenna, said first metallization being connected to said third metallization and said second metallization being connected to said third metallization, wherein said first, second, and third metallizations are on one or more substrates;

at least one electrical terminal to couple said first metallization to a microelectronic device; and

at least one electrical terminal to couple said second metallization to the microelectronic device.

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12. (Original) The antenna interface circuit of claim 11, further comprising:
at least one electrical terminal to connect said third metallization to an external antenna.
13. (Original) The antenna interface circuit of claim 11, further comprising:
fourth metallization, connected to said third metallization, forming an integrated antenna.
14. (Original) The antenna interface circuit of claim 11, wherein:
said antenna interface circuit includes multiple metallization layers, wherein said first metallization is located on a first metallization layer and said second metallization is located on a second, different metallization layer.
15. (Original) The antenna interface circuit of claim 14, further comprising:
a ground plane located on a third metallization layer, said third metallization layer being located between said first metallization layer and said second metallization layer.
16. (Original) The antenna interface circuit of claim 11, wherein:
said antenna interface circuit is flexible.
17. (Currently Amended) A system comprising:
a microelectronic device including: (a) a package having an upper side and a lower side, and (b) at least one microelectronic die having wireless circuitry therein mounted on said upper side of said package, wherein said lower side of said package includes a plurality of terminals to couple said package to a circuit board and said upper side of said package includes at least one terminal to provide communication with an external antenna; and
an antenna interface circuit to provide an interface between said microelectronic device and an antenna, said antenna interface circuit having at least one terminal that is connected to said at least one terminal on said upper side of said package;
wherein said antenna interface circuit includes power amplifier impedance transformer circuitry.

Claim 18 is cancelled.

19. (Original) The system of claim 17, wherein:

said antenna interface circuit includes low noise amplifier input matching circuitry.

20. (Original) The system of claim 17, wherein:

said antenna interface circuit includes duplexer circuitry to allow a wireless transmitter and a wireless receiver within said microelectronic device to share a common antenna.

21. (Original) The system of claim 17, wherein:

said antenna interface circuit includes power amplifier impedance transformer circuitry, low noise amplifier input matching circuitry, and duplexer circuitry to allow a wireless transmitter and a wireless receiver within said microelectronic device to share a common antenna.

22. (Original) The system of claim 17, wherein:

said antenna interface circuit includes multiple metallization layers.

23. (Currently Amended) ~~The system of claim 22, wherein:~~ A system comprising:

a microelectronic device including: (a) a package having an upper side and a lower side, and (b) at least one microelectronic die having wireless circuitry therein mounted on said upper side of said package, wherein said lower side of said package includes a plurality of terminals to couple said package to a circuit board and said upper side of said package includes at least one terminal to provide communication with an external antenna; and

an antenna interface circuit to provide an interface between said microelectronic device and an antenna, said antenna interface circuit having at least one terminal that is connected to said at least one terminal on said upper side of said package;

wherein said antenna interface circuit includes multiple metallization layers;

wherein said antenna interface circuit includes power amplifier impedance transformer circuitry on a first metallization layer and low noise amplifier input matching circuitry on a

second metallization layer, wherein said second metallization layer is different from said first metallization layer.

24. (Original) The system of claim 17, wherein:

said antenna interface circuit includes at least one antenna integrated therein.

25. (Currently Amended) ~~The system of claim 17, wherein:~~ A system comprising:

a microelectronic device including: (a) a package having an upper side and a lower side, and (b) at least one microelectronic die having wireless circuitry therein mounted on said upper side of said package, wherein said lower side of said package includes a plurality of terminals to couple said package to a circuit board and said upper side of said package includes at least one terminal to provide communication with an external antenna; and

an antenna interface circuit to provide an interface between said microelectronic device and an antenna, said antenna interface circuit having at least one terminal that is connected to said at least one terminal on said upper side of said package;

wherein said antenna interface circuit is coupled to an external antenna.

26. (Original) The system of claim 17, wherein:

said at least one microelectronic die is mounted on said upper side of said package using flip chip techniques.

27. (Original) The system of claim 17, wherein:

said plurality of terminals on said lower side of said package includes at least one of: a ball grid array (BGA), a pin grid array (PGA), and a land grid array (LGA).

28. (Currently Amended) ~~The system of claim 17, wherein:~~ A system comprising:

a microelectronic device including: (a) a package having an upper side and a lower side, and (b) at least one microelectronic die having wireless circuitry therein mounted on said upper side of said package, wherein said lower side of said package includes a plurality of terminals to

couple said package to a circuit board and said upper side of said package includes at least one terminal to provide communication with an external antenna; and

an antenna interface circuit to provide an interface between said microelectronic device and an antenna, said antenna interface circuit having at least one terminal that is connected to said at least one terminal on said upper side of said package;

wherein said antenna interface circuit is flexible.

29. (Original) A system comprising:

a patch antenna; and

an antenna interface circuit to provide an interface between a microelectronic device and said patch antenna, said antenna interface circuit including:

first metallization forming a power amplifier impedance transformer, second metallization forming a low noise amplifier input matching circuit, and third metallization forming a duplexer to couple an external transmitter and an external receiver to said patch antenna, said first metallization being connected to said third metallization and said second metallization being connected to said third metallization, wherein said first, second, and third metallizations are on one or more substrates;

at least one electrical terminal to couple said first metallization to a microelectronic device; and

at least one electrical terminal to couple said second metallization to the microelectronic device.

30. (Original) The system of claim 29, wherein:

said antenna interface circuit includes multiple metallization layers, wherein said first metallization is located on a first metallization layer and said second metallization is located on a second, different metallization layer.

31. (Original) The system of claim 30, further comprising:

a ground plane located on a third metallization layer of said antenna interface circuit, said third metallization layer being located between said first metallization layer and said second metallization layer.

32. (Original) The system of claim 29, wherein:

said antenna interface circuit is flexible.

33. (Currently Amended) A microelectronic device comprising:

a package having an upper side and a lower side; and

at least one microelectronic die having wireless circuitry therein mounted to said upper side of said package;

wherein said lower side of said package includes a plurality of terminals to couple said package to a circuit board and said upper side of said package includes at least one terminal to couple said microelectronic device to an external antenna;

wherein said at least one terminal on said upper side of said package includes at least one terminal to connect said microelectronic device to an external power amplifier impedance transformer.

34. (Original) The microelectronic device of claim 33, wherein:

said at least one microelectronic die includes a die having both digital processing circuitry and wireless transceiver circuitry located therein.

35. (Original) The microelectronic device of claim 33, wherein:

said at least one microelectronic die is mounted to said upper side of said package using flip chip techniques.

Claims 36, 37, 38, and 39 are cancelled.

40. (Currently Amended) The microelectronic device of claim [39]33, wherein:

said at least one terminal on said upper side of said package includes at least one terminal to connect said microelectronic device to an external low noise amplifier input matching circuit.

41. (Original) A microelectronic device comprising:

a package having an upper side and a lower side;

at least one microelectronic die having wireless circuitry therein mounted to said upper side of said package, wherein said lower side of said package includes a plurality of terminals to couple said package to a circuit board and said upper side of said package includes at least one terminal to couple said microelectronic device to an external antenna; and

an antenna circuit coupled to said at least one terminal on said upper side of said package, said antenna circuit including at least one microstrip antenna element.

42. (Original) The microelectronic device of claim 41, wherein:

said at least one microstrip antenna element includes a patch element.

43. (Original) The microelectronic device of claim 41, wherein:

said antenna circuit is flexible.